

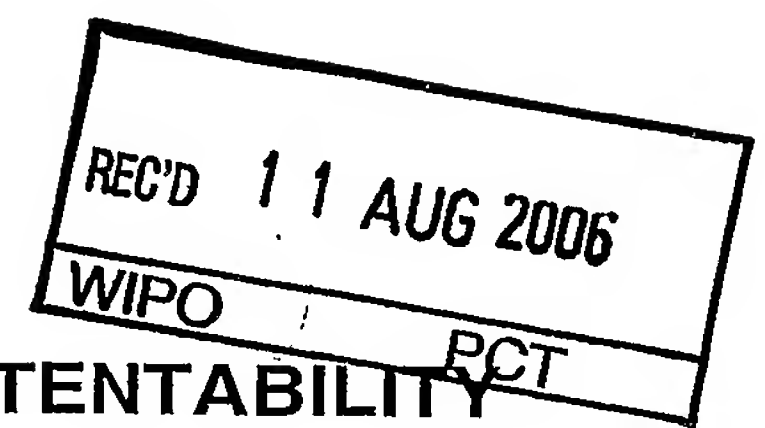
PATENT COOPERATION TREATY


PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)



Applicant's or agent's file reference R611-PCT	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/JP2005/008458	International filing date (day/month/year) 27.04.2005	Priority date (day/month/year) 27.04.2004
International Patent Classification (IPC) or national classification and IPC INV. B01J37/03 B01D53/94 B01J23/10 B01J23/63		
Applicant TOYOTA JIDOSHA KABUSHIKI KAISHA		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 3 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input checked="" type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand 27.02.2006	Date of completion of this report 10.08.2006	
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized officer Schoofs, B Telephone No. +31 70 340-2760	



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/JP2005/008458

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-34 as originally filed

Claims, Numbers

1-11 filed with telefax on 24.02.2006

Drawings, Sheets

1/5-5/5 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/JP2005/008458

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-5
	No: Claims	6-11
Inventive step (IS)	Yes: Claims	
	No: Claims	1-11
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following documents:
D1: PATENT ABSTRACTS OF JAPAN vol. 2003, no. 12, 5 December 2003 (2003-12-05) -& JP 2004 074138 A (TOYOTA MOTOR CORP), 11 March 2004 (2004-03-11)
D2: EP-A-1 415 956 (TOYOTA MOTOR CO LTD [JP]) 6 May 2004 (2004-05-06)
2. D1 discloses an exhaust gas purifying catalyst comprising a core part with zirconia and a surface layer with ceria (D1, figure 1). The catalyst further comprises a noble metal and has a Ce/Zr ratio of 5/95 - 50/50 (D1, paragraphs 18 and 22). The core and surface part of the particles of D1 inevitably contain primary particles and the boundary between the core part and the surface layer can be said to be gradually changing (see also item VIII below). The subject-matter of claim 6 is therefore not new (Article 33(2) PCT).
 - 2.1 Although D1 does not disclose a preparation method wherein the pH of the sol is subsequently adjusted to the isoelectric point of the ceria and zirconia particles, it cannot be seen that such a differentiating feature is associated with any technical effect that could support the presence of an inventive step. Hence, no inventive step is present in the subject-matter of claim 1 (Article 33(3) PCT).
 - 2.2 Dependent claims 2-5 and 7-11 do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty (Article 33(2) PCT), or are associated with any technical effect that could support the presence of an inventive step (Article 33(3) PCT).

**INTERNATIONAL PRELIMINARY
REPORT ON PATENTABILITY
(SEPARATE SHEET)**

International application No.

PCT/JP2005/008458

Re Item VI

Certain documents cited

Certain published documents

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (<i>valid claim</i>) (day/month/year)
EP-A-1 415 956	06.05.2004	27.10.2003	28.10.2002

Re Item VIII

Certain observations on the international application

1. The expression "gradually changing" as used in claim 6 is not clear (Article 6 PCT). In the absence of a clear definition, such an expression cannot be used to differentiate the claimed subject-matter from the prior art.

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CLAIMS

1. A process for producing a metal oxide particle comprising a core part and a surface layer differing in the composition, the process comprising:

5 providing a sol containing at least a population of first colloid particles and a population of second colloid particles differing in the isoelectric point with each other,

10 adjusting the pH of said sol to be closer to the isoelectric point of said population of first colloid particles than to the isoelectric point of said population of second colloid particles, thereby aggregating said population of first colloid particles,

15 adjusting the pH of said sol to be closer to the isoelectric point of said population of second colloid particles than to the isoelectric point of said population of first colloid particles, thereby aggregating said population of second colloid particles onto said population of first colloid particles
20 aggregated, and

drying and firing the obtained aggregate.

2. The process according to claim 1, wherein the pH of said sol is changed to pass the isoelectric point of said population of first colloid particles, thereby
25 aggregating said population of first colloid particles.

3. The process according to claim 1 or 2, wherein the pH of said sol is changed to pass the isoelectric point of said population of second colloid particles, thereby aggregating said population of second colloid
30 particles.

4. The process according to any one of claims 1 to 3, wherein said population of first colloid particles and said population of second colloid particles each is

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independently selected from the group consisting of alumina, ceria, zirconia and titania colloid particles.

5 5. The process according to claim 4, wherein said population of first colloid particles is zirconia, alumina or titania, and said population of second colloid particles is ceria.

10 6(Amended). An exhaust gas purifying catalyst for internal combustion engine, comprising a particulate support and a noble metal supported thereon,

15 wherein the particulate support comprises a core part and a surface layer, the molar fraction of the zirconium constituting the zirconia in the core part being higher than the molar fraction of the zirconium constituting the zirconia in the surface layer, and the molar fraction of the cerium constituting the ceria in the surface layer being higher than the molar fraction of the cerium constituting the ceria in the core part;

20 wherein said core part and said surface layer each comprises a plurality of primary particles;

25 wherein the composition of the boundary between said core part and said surface layer is gradually changing; and

30 wherein the content of ceria in the particulate support being 40 to 65 mol% or less.

7. The exhaust gas purifying catalyst for internal combustion engine according to claim 6, wherein the content of CeO_2 in the particulate support is 45 to 55 mol%.

8. The exhaust gas purifying catalyst for internal combustion engine according to claim 6 or 7, wherein the surface layer comprises at least one element selected from the group consisting of alkaline earth metals and rare earths.

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9. The exhaust gas purifying catalyst for internal combustion engine according to claim 8, wherein the element comprised in the surface layer is at least one element of Y and Nd.

5 10. The exhaust gas purifying catalyst for internal combustion engine according to claim 6 or 7, wherein the core part comprises at least one element selected from the group consisting of alkaline earth metals and rare earths.

10 11. The exhaust gas purifying catalyst for internal combustion engine according to claim 10, wherein the element comprised in the core part is Y.